

**MICRONIZATION PROCESS AND POLYMER PARTICLES
PRODUCED THEREFROM**

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ABSTRACT OF THE DISCLOSURE

The present invention relates to a process for producing substantially rounded thermosetting or thermoplastic polymer particles and also to a device used therefor. The process includes forming a mixture of polymer pellets with at least one surfactant in an aqueous medium, rapidly melting the polymer pellets under plug flow and plug free heating conditions, shearing the melted pellets into the polymer particles, and rapidly cooling the polymer particles under plug free cooling conditions. Thermosetting particles can include a blend of thermosetting polymers and crosslinking agents. The device provides for plug free conditions to ensure high production rates with substantially no clogging in the polymer conveying and polymer shearing means used in the device. The plug flow conditions ensure more uniform and predictable shearing conditions, since the polymer pellets under the plug flow condition results in substantially no pellet to pellet variation in the pellet temperature. As a result, the coatings resulting from the use of these polymer particles have predictable and uniform powder coating properties. The process produces aqueous polymer particle slurry, which if desired, may be converted into polymer powder by removing water. The polymer particles are particularly suited for powder coatings in automotive OEM and refinish applications, and industrial coatings.